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Emergency Management Business Process Reengineering and Integrated Emergency Response System Structure Design for a City in China

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Abstract

How to handle emergencies is the core of government emergency management. This paper reformed emergency management business process base on Qinzhou government's emergency management work. A city integrated emergency response system (CIERS) was also designed according to this business process and the actual situations of the city's emergency were also considered. The new structure applies an innovative idea that was centralization and authorization emergency management mode (CAEMM). To perform this idea, the government will set up a city integrated emergency response center (CIERC), and authorize the emergency platform to deal with the basic routines; the significant events are disposed by emergency decision-making platform with an overall consideration.

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Keywords: business process reengineering; city integrated emergency response system; emergency management

1. Introduction

Emergency has become the biggest threat to public safety. the chain reaction can be easily produced when emergencies happened, which will enlarge the size of the disaster and finally cause catastrophic consequences [1]. China is now in the transition period of economic and social development; the contradiction between the severe situation and lack of relatively weak basis of public security and the high-speed economic development is becoming increasingly prominent [2]. Events such as Wenchuan earthquakes in 2008, drought in 2010 spring and Wenzhou power car rear-end event in 2011 have caused strong social influence.

Qinzhou is located in China's southwest coast, having an area of 10843 square kilometers and a population of 3.1 million. The economy has been under the way of rapid development in recent years, so unavoidable causes various emergencies happening easily. The probability of public emergencies occurrence increased obviously. At This situation it has been a great challenge to emergency management. To handle public emergencies, Qinzhou has already carried out a series of emergency management work, but there still are some difficult management problems to be solved.

Correlational researches on emergency management believe that the coalition command mechanism should be applied when facing emergency. That means when the emergency is related to more than one department, it needs city integrated emergency response center(CIERC) which is made up by some of the government agency personnel in order to coordinate emergency sources and movements [3,4]. In this paper emergency management business process in government will be rebuilt, and City Integrated Emergency Response System (CIERS) will be designed according to the Qinzhou public security emergency. And all above will make the innovation emergency management and technique in Qinzhou city.

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2. Emergency management business process and work mode in Qinzhou city

Emergency management occurs lately in China compared with other countries, and the city emergency management pattern in China is showed in table I. Each management pattern has its own advantages and disadvantages, and meanwhile different cities have their own special emergency needs and environment [3-6]. So it is significant to design an appropriate emergency management mode and business process according to specific city emergency management needs.

The Qinzhou city emergency organization structure at present is shown as Fig. 1.

Emergency management in Qinzhou city is similar to the cooperative mode in terms of organization framework. The work mainly depends on the specific emergency command center. The difficulties that emergency management faces are as follows:

(1)Emergency business can't react fast

Different independent command centers coexist with a loose connection. In this situation, emergency can't be deposed as a whole, and all relevant units can't assist the department which is in charge of the emergency disposal. The loose state is also not adapted to the needs for dealing emergence as a whole team. When an emergency happens, the special emergency command center is responsible for the emergency alarm receiving and prophase disposal. If the emergency enlarges, the scene headquarter or temporary headquarter will be set up after reporting the situation to the government, and the other departments assist to solve the problem at the same time. The business process is shown as the Fig. 2.

Table 1. Cross-references for urban emergency management mode in China

Mode	Emergency Management Method	Representative	Advantage	Disadvantage
Centralization	Setting up CIERS, uniform alarm and unified handling alert	Nanning	Giving a unified response, Sharing resources,	Having a big conflict with the existing administration system
Authorization	Authorizing the command rights to a certain department, basing on the authorized department, coordinating the other units to disposal the emergency	Guangzhou, Shanghai	Reserving all departments' emergency organization structure	Having an authorized size problem; Having difficulty to solve the interconnection problem between the public security private network and government internet.
Agency	Setting up an alarm-receiving center, distributing the records to one or multiple department to solve the emergency.	Beijing	Reserving all departments' emergency organization structure	It will take a long time for different departments to coordinate getting a unified response.
Cooperation	Different types of CIERC combined through the network, composed of one government CIERC and multiple department CIERC	Yangzhou	Suitable for medium and small size city	having information sharing problem for key data

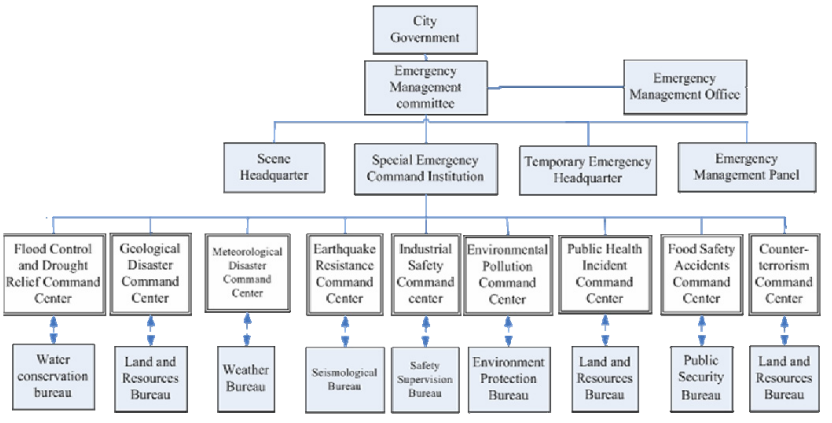


Fig. 1. The current emergency organization structure in Qinzhou city

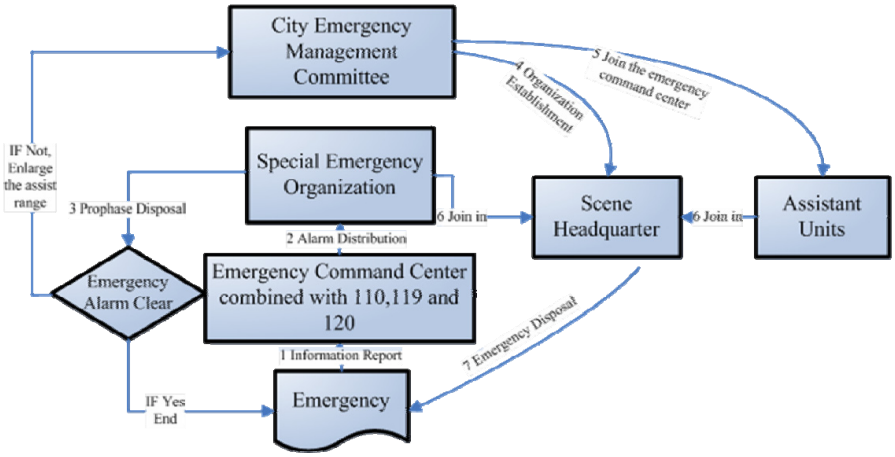


Fig. 2. The current emergency business process in Qinzhou city

This emergency business process has not brought the best aspect of all cooperative departments. The cooperative departments lack contact with special emergency organization. This pattern indirectly causes low efficiency of emergency management.

(2)Government orders are impeded when dealing with emergency

There are different emergency command centers which are controlled by different government departments. All the departments are the same rank, which will easily cause the cooperative units reacting slackly towards the specific emergency command center. So the orders do not work well and results a bad cooperative effect when all the departments join in the emergency disposal.

(3)Emergency information can't be shared

Special emergency command centers are consisted in related function departments which are responsible for the daily emergency management work. So the other cooperative units may not have their own permanent staff in the emergency command center. When emergency happens, the special emergency commands institutions may not be able to get contact all relevant units that offer assistance. Information is gathered in the charging department, which cannot be transported smoothly to other cooperative units and quickly share the information with special emergency command center, and form the "information island" effect.

(4) Emergency competence of district government is not clear

The role of district government is not proposed in this emergency management structure. Emergency information is not passed by the district government during the process of dealing with the emergency. This eventually causes lack of territorial advantage of district government.

(5) CIERS lags behind

CIERS is built only in Qinzhou public security bureau while the other government departments have no such emergency command system. The government emergency management committee is lack of CIERS, so it is difficult to coordinate every related unit efficiently.

3. Emergency management business process reengineering program

In order to change the difficult condition of emergency management, this paper reengineers the current emergency structure combined with realities of Qinzhou city, repeals the special emergency command center and builds Qinzhou CIERC. This center is responsible for the emergency management work within the whole scope of the city. Fig. 3 shows the restructured emergency structure.

This CIERC is composed of different department faculty which contains integrate alarming, unity command, grading response and role reset, and the district government is given more right and responsibility at the same time.

Integrate alarming: Emergencies that occur within the scope of the whole city are unified accepted by the city integrated emergency response center to avoid the information island effect.

Unity command: After reading the overall situation of the emergency, city integrated emergency response center handles alert uniformly to avoid the quick coalition failure in Emergency business.

Grading response: According to the principle of classified disposal, general emergency is disposed by responsible emergency units. For significant events, city integrated emergency response center schedules the emergency units in order to give an integrated response. This can solve the management mechanism problems.

Role reset: Considering the type and needs of emergency, city integrated emergency response center resets the role of all emergency member units. This can avoid low efficiency and lack of coordination when the same rank units deal with the emergency work.

Local government is the administrative agency in charge of public emergency management work among its administrative area. Each district establishes corresponding integrated emergency response center which mainly takes care of emergency work among its administrative area.

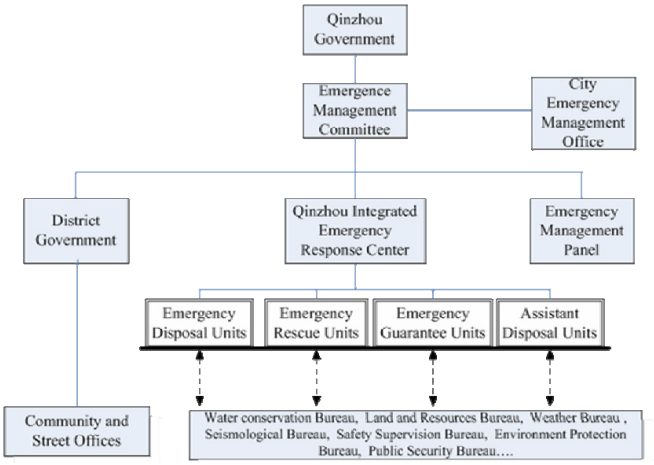
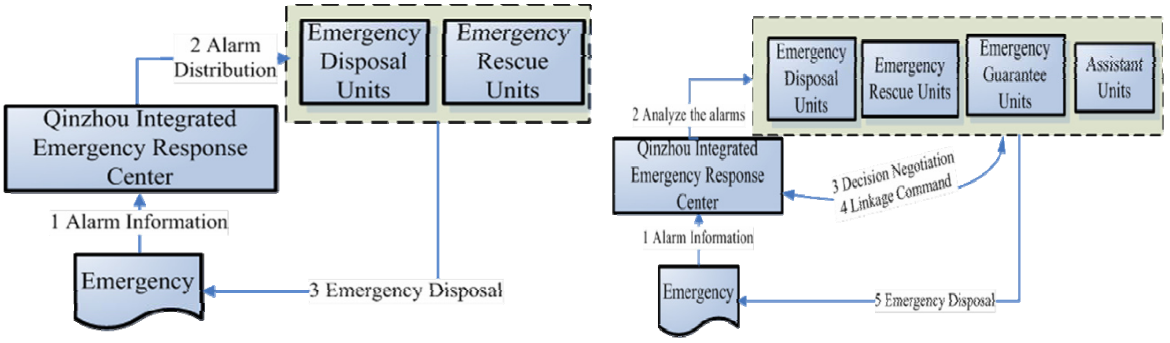


Fig. 3. Emergency organization structure in Qinzhou city after restructures



(a) General emergency response process

(b) Significant emergency response process

Fig. 4. Emergency response process after restructure

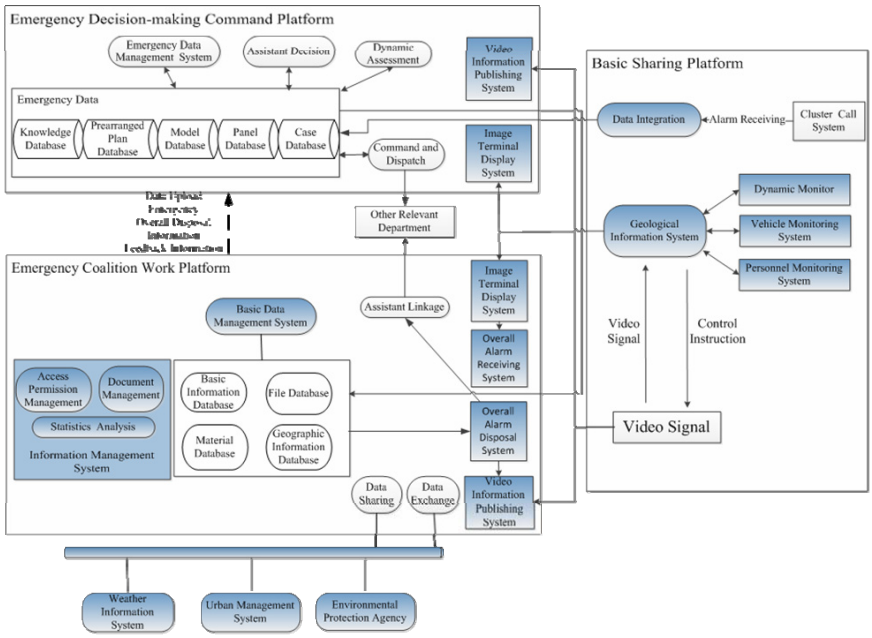


Fig. 5. Logical structure for Qinzhou city integrated emergency response system

4. City integrated emergency response architecture design

To ensure emergency management work developing effectively after the structure reengineering, there is a need to build CIERS and form a unified and cooperative combat system using information technology.

In order to integrate the existing resources and save government expanding, the police net (receiving alarms using the net combined by 119,122 and 110; alarms disposal system) can be used to form CIERS [7]. This network is an internal communication network and computer information system for police. For police net has special security requirement, the database cannot be completely shared, and the structure problem cannot be solved in a short time. So CIERS cannot always rely on this network.

According to the current emergency situation in Qinzhou city, CIERS utilizes centralization and authorization emergency management mode (CAEMM), which gives the priority to centralization and then take authorization as a supplement and combine both methods. That means Qinzhou CIERC takes action with everything taken into consideration. CIERS contains two sub platforms: emergency coalition work platform and emergency decision command platform. Emergency coalition work platform, based on the police network, receives and deals with the alarm from an overall point of view. This platform is authorized to deal general emergency. Emergency decision command platform increases a private network so that it can take charge of the entire significant emergency.

This paper has designed a logical Qinzhou CIERS structure shown in fig. 5. This structure is based on the system utilization and management organizational structure. From the point of system deployment, Qinzhou CIERS is consisted of basic sharing platform, emergency coalition work platform and emergency command decision platform. Emergency coalition work platform is a focal point and management center dealing with emergency information from all over the city. Emergency command decision platform is the decision center which makes emergency workaround and schedules the whole strength force.

5. Conclusion

This paper designs reengineered plan of the emergency management structure and the emergency management business process according to current emergency management work of the Qinzhou city government, characteristics of emergency management and the needs of emergency. Through unified alarm, unified command and resetting role, the new process can solve the current difficulty faced by Qinzhou government.

We also reference other emergency management Mode in china, proposing a new systematic pattern, called CAEMM. The new model contains two important parts: coalition work platform and emergency command platform. Coalition work

platform based on the police network, gives authority to the police to deal with normal emergency. While the emergency command platform adding a private network, can give associated response to the significant emergency. These improvements can enable emergency management business process operating orderly from both managing and technical aspects.

Acknowledgements

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